



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

June 10, 2014

MEMORANDUM

SUBJECT: National Remedy Review Board Recommendations for the Matthiessen and Hegeler Zinc Company Site, Operable Unit 1 and 2

FROM: Amy R. Legare, Chair
National Remedy Review Board

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TO: Richard Karl, Director
Superfund Division
U.S. EPA Region 5

Purpose

The National Remedy Review Board (the Board) has completed its review of the proposed cleanup action for the Matthiessen and Hegeler Zinc Company Site, Operable Unit 1 and 2 (OU 1 and 2) Superfund site, in LaSalle, Illinois. This memorandum documents the Board's advisory recommendations.

Context for Board Review

The Administrator established the Board as one of the October 1995 Superfund Administrative Reforms to help control response costs and promote consistent and cost-effective remedy decisions. The Board furthers these goals by providing a cross-regional, management-level, "real time" review of high cost proposed response actions prior to their being issued for public comment. The Board reviews all proposed cleanup actions that exceed its cost-based review criteria.

The Board review is intended to help control remedy costs and to promote both consistent and cost-effective decisions. Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), in addition to being protective, all remedies are to be cost-effective. The Board considers the nature of the site; risks posed by the site; regional, state, tribal and potentially responsible party (PRP) opinions on proposed actions; the quality and reasonableness of the cost estimates; and any other relevant factors or program guidance in making our advisory recommendations. The overall goal of the review is to ensure sound decision making consistent with current law, regulations, and guidance.

Generally, the Board makes the advisory recommendations to the appropriate regional division director. Then, the region will include these recommendations in the administrative record for the site, typically before it issues the proposed cleanup plan for public comment. While the region is expected to give the Board's recommendations substantial weight, other important factors, such as subsequent public comment or technical analyses of response options, may influence the region's final remedy decision. The Board expects the regional division director to respond in writing to its recommendations within a reasonable period of time, noting in particular how the recommendations influenced the proposed cleanup decision, including any effect on the estimated cost of the action. Although the Board's recommendations are to be given substantial weight, the Board does not change the Agency's current delegations or alter the public's role in site decisions; the region has the final decision-making authority.

Overview of the Proposed Action

EPA Region 5's proposed action for the Matthiessen and Hegeler Zinc Company Superfund site covers two operable units, OU1 and OU2. The site is located in the town of LaSalle, Illinois. OU1 covers approximately 47 acres and comprises the southern portion of the site, including the Little Vermilion River adjacent to the site's east side. OU1 includes the majority of a large slag pile along the river generated from smelting operations on OU2. An operating chemical plant is located on the western portion of the OU1 property. OU2 comprises the approximately 180-acre northern, main industrial portion of the former Matthiessen and Hegeler Zinc Company property where all the former smelter operations took place, as well as nearly 5,000 properties in the surrounding residential area to the south, west and north. The potentially responsible party is leading the remedial investigation/feasibility study (RI/FS) at OU1 while OU2 is fund-lead, although one comprehensive RI/FS is being produced for the site as a whole. The State of Illinois has classified the groundwater at the site as Class II General Resource (i.e., non-potable) groundwater.

Operations at the smelter began in 1858, when raw materials such as zinc ore and various grades of coal were transported to the site to smelt zinc. A rolling mill was built in 1866 to produce zinc sheets. This process included a furnace that used producer gas as fuel, and any sulfur dioxide generated was recovered and converted into sulfuric acid and stored in on-site tanks. OU2 also had an ammonium sulfate fertilizer plant that operated for a few years during the early 1950s. Zinc smelting ceased in 1961, and sulfuric acid manufacturing halted in 1968. Rolling mill activities continued until 2000 when the rolling mill company declared bankruptcy.

During the RI, each OU was broken down into different exposure areas based primarily on each area's current and reasonably anticipated land uses. Remedial action objectives (RAOs) and remedial alternatives were then developed for each separate exposure area within OU1 and OU2. Region 5's preferred alternative that was presented to the Board for each site area is as follows:

Operable Unit 1

Plant Area – Alternative 5 – Low Permeability Cover + Institutional Controls + Property Access Restrictions: Protection would be provided by restricting soil exposure through covering of exposed soil with concentrations above cleanup levels. A low permeability cover would also reduce contaminant migration through restricting stormwater infiltration. Institutional controls (ICs) consisting of deed and property access restrictions would also be put in place to restrict soil and groundwater exposures. An implementation challenge includes coordination of cover construction with site personnel in order to minimize disruption to plant operations. Total present worth cost = \$1,268,000.

Slag Pile Area – Alternative 5 – Low Permeability Cap + Institutional Controls + Property Access Restrictions and Alternative 15 – Sloping and Benching + Plantings + Revetments at the Toe of the Slope + Best Management Practices: This alternative includes sloping and benching measures, plantings and construction of revetments at the toe of the slope to prevent slag erosion and transport to the Little Vermilion River. Best management practices would also be implemented to minimize impacted stormwater migration down-gradient. This alternative addresses areas of the Slag Pile Area through capping, ICs and property access restrictions. Total present worth cost = \$24,769,000.

Groundwater – Alternative 2 – Institutional Controls Only: This alternative ensures that groundwater at OU1 would be restricted through ICs. Total present worth costs were included with the costs of the Plant Area and Slag Pile Area alternatives listed above.

Operable Unit 2

Building 100 Area – Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover: This alternative incorporates excavation and on-site consolidation of soil. The excavated soil would be placed in an on-site consolidation area (located at the OU2 Main Industrial Area) and covered by a soil cover that would restrict direct contact with contaminated soil. The excavated area would be backfilled to the original grade, and grass and trees would be planted to stabilize the area. Total present worth cost = \$4,046,000.

Rolling Mill Area – Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover: This alternative incorporates excavation and on-site consolidation of soil. The excavated soil would be placed in an on-site consolidation area (located at the OU2 Main Industrial Area) and covered with a clean soil cover that would restrict direct contact with contaminated soil. The excavated area would be backfilled to the original grade, and grass and trees would be planted to stabilize the area. Total present worth cost = \$4,505,000.

Main Industrial Area – Alternative 2 – Soil Excavation + On-Site Consolidation under a Soil Cover + Institutional Controls: This alternative incorporates excavation and on-site consolidation of soil. The excavated soil would be placed in an on-site consolidation area within the Main Industrial Area and covered with a clean soil cover that would restrict direct contact with contaminated soil. The excavated area would be backfilled to the original grade, and grass and trees would be planted to

stabilize the area. ICs consisting of deed and property access restrictions would also be put in place to restrict soil exposures and to protect the integrity of the remedy components. Total present worth cost = \$36,130,000.

North Area – Alternative 2 – Institutional Controls Only: This alternative includes property access and use restrictions for the contaminated North Area soils. Total present worth cost = \$283,000.

Off-Site Residential Area – Alternative 3 – Soil Excavation + On-Site Consolidation under a Soil Cover: This alternative incorporates excavation and consolidation of soil. The excavated soil would be placed in an on-site consolidation area (located at the OU2 Main Industrial Area) and covered by a soil cover that would restrict direct contact with contaminated soil. Excavated soil would be replaced with clean soil to maintain the original grade. Based on the sampling conducted during the RI, an estimated 2,278 properties are expected to require cleanup. Total present worth cost = \$100,234,000.

Groundwater – Alternative 2 – Institutional Controls Only: This alternative incorporates groundwater-use and property-access restrictions, together with groundwater monitoring, for OU2-wide groundwater. This alternative would address the potential vapor intrusion risk and the groundwater analyte concentrations in excess of cleanup levels through the implementation of ICs. Total present worth cost = \$1,076,000.

National Remedy Review Board Advisory Recommendations

The Board reviewed the information package describing this proposal and discussed related issues with Region 5 management and staff (Becky Frey and Demaree Collier) on March 12, 2014. Mike Haggitt of Illinois Environmental Protection Agency participated by telephone. Based on this review and discussion the Board offers the following comments:

Site Characterization

The Board notes that the presentation identified potential indoor vapor intrusion risk from trichloroethylene attributed to the Rolling Mill area groundwater hot spot. The Board recommends that, for a currently occupied building, it may be prudent to perform indoor air sampling prior to determining the need to install a vapor mitigation system.

Institutional Controls

Based on the information presented to the Board, the Region's preferred alternative for groundwater in OUs 1 and 2, and for soils in the North Area, would be an IC-only approach. In addition, the Region's package indicates that there may be an unacceptable non-cancer risk to future residents and commercial/industrial/construction workers exposed to soil contamination in the North Area. The Board notes that the NCP's expectations disfavor IC-only remedies unless there are no practicable alternatives. The Board also notes that existing CERCLA guidance documents (e.g., Office of Solid Waste and

Emergency Response (OSWER) Directive No. 9355.0-89, December 2012, *A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites*, and OSWER Directive No. 9355.7-04, May 1995, *Land Use in the CERCLA Remedy Selection Process*) discuss the role of ICs as part of active remedies and address consideration of current and reasonably anticipated future land use. The Board recommends that the Region's decision documents explain how its approach is consistent with the NCP and existing CERCLA guidance.

Human Health Risk

The presentation to the Board identified that the residential exposure scenario included an exposure frequency of approximately 275 days per year. The Region noted site-specific information such as snow cover was used to develop the value. The Board notes that this site-specific value is less than the recommended default value of 350 days per year for residential exposure frequency (OSWER Directive No. 9285.6-03, March 1991, *Risk Assessment Guidance For Superfund, Volume I, Supplemental Guidance, "Standard Default Exposure Values"*), and it is unclear how future precipitation changes might affect this site-specific value. The Board recommends that the Region clearly explain in the decision documents how this evaluation, using a lower exposure frequency than the recommended default value, is protective of human health for a remedy that would allow for unlimited use and unrestricted exposure without the need for ICs.

Ecological Risk

The materials presented to the Board did not contain any ecological risk-based PRGs even though the site has ecologically relevant areas and/or ecological use. The Board recommends, consistent with the remedy selection threshold criteria, that the Region clearly explain in the decision documents how its preferred approach would be protective of human health and the environment. Typically, this may be accomplished in the decision documents by either documenting that the site areas do not pose any ecological risks or by presenting how the selected remedy obtains ecological protectiveness by meeting ecologically based remediation goals.

Remedial Action Objectives/Preliminary Remediation Goals

Based on the information provided to the Board, it appears that the Region has decided that the exceedances of the State's Class II General Resource (*i.e.*, non-potable) groundwater standards warrant the use of CERCLA response authority. The Board recommends that the Region explain in its decision documents how its approach to groundwater cleanup at this site is consistent with the NCP and existing CERCLA guidance documents (*e.g.*, OSWER Directive No. 9355.3-01, October 1988, *Guidance for Conducting Remedial Investigations and Feasibility Studies* and OSWER Directive No. 9200.1-23P, July 1999, *Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*). For example, the decision documents should discuss how RAOs were developed for groundwater for this Class II aquifer (*i.e.*, explain how the site's groundwater is being restored to its beneficial use) and how it analyzed a full range of alternatives (*e.g.*, active remediation options beyond an IC-only approach), and how its preferred approach is consistent with the NCP's expectations, including 40 CFR 300.430(a)(1)(iii)(D)].

In the package provided to the Board, a proposed OU1 RAO includes language to reduce surface water run-off from on-site soils into the Little Vermilion River “to the extent practicable.” It appears to the Board that the remedial alternatives considered would not require the caveat “to the extent practicable.” The Board recommends that the decision documents clearly explain any potential limitations on the practicability of the remedies evaluated for addressing the slag.

The Region’s package provided to the Board included several proposed on-site actions that include capping as a remedial component. The proposed RAOs for addressing on-site soils do not include protection of groundwater. Yet the package includes details for a low-permeability cap that would be protective of groundwater by mitigating leaching surface water through the contaminated soil. The Board recommends that the Region consider, consistent with potential Applicable or Relevant and Appropriate Requirements, a less restrictive “cover” approach that may be less expensive and allow for more flexibility during design.

In the package presented to the Board, preliminary remediation goals (PRGs) for OU2 residential properties appear to be based on a hazard quotient of 1 or an excess lifetime cancer risk of 10^{-4} , since PRG concentrations associated with a 10^{-6} and a 10^{-5} excess lifetime cancer risk are below background levels (arsenic background is 11.8 parts per million). Consistent with the NCP at 40 CFR 300.430(e) and EPA guidance, “*Rules of Thumb for Superfund Remedy Selection*” (EPA 540-R-97-013, August 1997), PRGs for carcinogenic chemicals generally should be set at concentrations that achieve 10^{-6} risk. In addition, EPA generally does not remediate below background levels (see e.g., *Rules of Thumb*, 1997; OSWER 9285.6-07P, May 2002, *Role of Background in the CERCLA Cleanup Program*). The Board recommends that the Region explain in the decision document how its approach for setting PRGs is consistent with CERCLA policy. The Board also recommends that the Region review the PRGs to ensure that the process to identify these goals is consistent with the NCP and EPA policy regarding risk levels and background.

The Board notes that the presentation and review materials utilized the phrase “remedial action levels.” The Board recommends that, consistent with the NCP and existing CERCLA guidance (e.g., 1999 ROD guidance, footnote 23), the decision documents be written in terms of PRGs and cleanup levels.

Remedy Performance

Based on information provided to the Board, the Region is recommending a very large-scale cleanup for residential properties. Because of the large number of properties needed to be investigated and cleaned up under the Region’s preferred approach, and the length of time that would be required before all the properties can be addressed, the Board recommends that the decision documents clearly explain how the properties’ investigation and cleanup might be prioritized. In developing a phased approach for the residential cleanup activities, prioritization might be made for: addressing properties with higher concentrations first, where sensitive receptors (e.g., children or pregnant women) are present, or where children with elevated bloodlead levels are present. The Board further recommends that the Region develop a community outreach effort for the residential study area to help inform the community about potential steps that may be taken to protect themselves in the interim, before the remedy can be fully

implemented. The Board also recommends that the Region consider adding an indoor dust assessment component to residential sampling collected during remedial design.

Alternative Remedy

Based on information provided to the Board, it appears that arsenic in soil poses a human health risk at this site. The Board recommends that the Region consider the use of phytoremediation using Chinese fern for arsenic removal from soil as part of the remedial action (in addition to ICs) for the North Area in OU2 and groundwater in OU1. The Chinese fern, an arsenic hyperaccumulator, has shown effective removal of soil arsenic in both lab and field studies using varying environmental conditions. This approach may help decrease soil arsenic at this site to levels below the 18.15 mg/kg PRG in several years since several cuttings of the plant materials can be harvested each year. The Board also recommends that the Region evaluate proper disposal of the arsenic-bearing plant materials.

Costs

In the package presented to the Board, the estimated cleanup cost per residential property is approximately \$44,000. This estimate appears high since, under the Region's preferred approach, the excavated soils would be disposed of on-site and not at an off-site facility. Typically disposal cost/fees represent a big part of residential cleanup costs. Also, considering that a large number of properties may be cleaned up, costs per unit should be further reduced due to economies of scale. The Board recommends that the cleanup costs for the residential properties be re-evaluated and presented in the decision documents.

Comprehensive Environmental Response, Compensation and Liability Act Authority

In the material presented to the Board, the Region stated that slag pile-area risks are limited to human health direct contact based upon manganese exposure. The Board recognizes the physical hazards associated with the current condition of the slag pile, including unstable steep slopes that may erode, or are eroding, into the river. While potential adverse impacts on the river are important, it was unclear to the Board whether the use of CERCLA authority for slag remediation to reduce these risks is warranted. The Board recommends that in the decision documents the Region clearly explain the RAO associated with cleaning up the slag pile and how slag pile remediation is warranted under CERCLA.

Conclusion

We commend the Region's collaborative efforts in working with the Board and stakeholder groups at this site. We request that a draft response to these recommendations be included with the draft proposed plan when it is forwarded to the Office of Superfund Remediation and Technology Innovation's Site Assessment and Remedy Decisions (SARD) branch for review. The SARD branch will work with both your staff and the Board to resolve any remaining issues prior to your release of the record of decision. This memo will be posted to the Board's website (<http://www.epa.gov/superfund/programs/nrrh>) within

30 calendar days of my signature. Once your response is final and made part of the site's administrative record your response will also be posted on the Board's website.

Thank you for your support and the support of your managers and staff in preparing for this review. Please call me at (703) 347-0124 should you have any questions.

cc: R. Richardson (OSRTI)
D. Stalcup (OSRTI)
R. DeLeon (OSRE)
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